

Global Security Briefing – August 2018

The Other Weapons of Mass Destruction

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Summary

This month marks the fifth anniversary of the Syrian regime's first major documented use of chemical weapons in Ghouta, amid warnings of further imminent chemical attacks as the battle for Idlib looms. With the rapid erosion of the prohibition on use by states of chemical weapons, and the rise of radical non-state groups seemingly willing to utilise whatever weapons of mass destruction they can obtain, what can the international community do to restrain their use? And what do advances in neuroscience portend for the development and use of new kinds of chemical control agents?

Introduction

Recent briefings in this series have included the analysis of the risk of international crises arising from two potential confrontations involving the United States - with North Korea and Iran. Near the end of this month President Trump decided to curtail Mike Pompeo's planned visit to Pyongyang, citing lack of concessions from North Korea over its nuclear programme. This, along with contradictory messaging on US-South Korea military exercises and Trump's social media lambasting of China's influence on North Korea, does not mean that a crisis is imminent but does suggest that the US President is gradually comprehending that the progress he boasted of in Korean denuclearisation is not going to happen. In the case of Iran there continued to be forceful statements from President Trump which were met with firm declarations of resolve, most notably from the Iranian Revolutionary Guard Corps.

For both Iran and North Korea, the core concerns of the Trump administration are with nuclear weapons and in both cases the tensions are bilateral. Even so, they both have global implications and one effect of this focus has been to divert attention from a longer-term issue that is at least as serious – the risk of a slow deterioration in what had been a near-global consensus on the banning of chemical weapons (CW). Over the past five years, the repeated use of these weapons in the Syrian civil war and the intentional dispersal of chemical agents in apparent assassination attempts in Malaysia (2017) and the UK (2018), ostensibly by North Korean and Russian agents, have contributed to the erosion of this consensus. There are also other even greater reasons for concern.

One response to this is that a number of academic and think tank analysts working on chemical arms control have cooperated with the UK's Royal Society of Chemistry (RSC) to produce a substantial volume on the relevant issues which was published earlier this month. This briefing summarises some of the main issues raised in the book, *Preventing Chemical Weapons: Arms Control and Disarmament as the Sciences Converge*, (Michael Crowley, Malcom Dando and Lijun Shang (editors), Royal Society of Chemistry, London, August 2018), and summarised in an [article](#) also published this month.

The authors of the volume have two concerns, one of which is immediate and the other longer term, though their view is that the latter is actually much more important. This is because, as the title indicates, the book examines scientific developments which may have considerable value to society but are also dual-use in that they may readily aid the military development of novel chemical agents with wide-ranging effects and security implications.

Immediate Concerns

The short-term issue relates directly to the developments cited above, the actual use of chemical agents, especially in the Middle East. As the RSC book points out, one of the lessons of the failure of the wars after 9/11 is that we are now in a transition to “irregular war” that involves paramilitary movements, especially but not only in the Middle East and northern and central Africa. Al-Qaida, the so-called Islamic State and other groups have come to the fore, and this is at a time when the Syrian state and possibly some rebel groups have been willing to use chemical weapons.

While this has not yet become the norm in irregular war, there has certainly been an erosion of previous prohibitions and this has come at a time when these movements have been suppressed with considerable force, principally in the US-led coalition air war. In the past four years this has killed tens of thousands of their supporters in Iraq, Syria and elsewhere.

One major response has been a determination by Islamic State supporters and others to take the war to the “far enemy” of Western states, with this reflected in many attacks in Germany, France, Belgium, Turkey, Spain, the United States, UK and elsewhere. While some of these have been aimed at police and military, for the most part they have attacked civilians, the aim being to maximise casualties.

There is no end to this war in sight and given the determination of the attackers it is highly likely that if chemical weapons are available to them then they will be used, especially as those using them may well be ready to die for their cause. If there are such attacks then one effect will be further to erode the international norm against the use of chemical weapons.

Neuroactive Agents and Longer-term Issues

This is not, though, the main concern of the contributors to the RSC book, which focuses primarily on rapid developments in the neurosciences, many of them likely to be highly desirable for human well-being but also with dangerous potential for misuse. The essence of the issue is, as the RSC editors put it, the growing potential for the “hostile manipulation of the brain”.

The problem is not new, in that the use of incapacitating neuroactive chemical agents in social and public order control has been researched for some decades, not least in the United States as early as the 1950s and by the both blocs throughout the Cold War years. More recently there have been cases when their actual use has gone disastrously

wrong, most notably the Moscow Theatre siege in October 2002. Then, the seizure of the Dubrovka Theatre by a large group of Chechen rebels resulted in some 900 people being held hostage. Russian Special Forces ended the siege after three days by introducing derivatives of the opiate fentanyl into the ventilation system but what was expected to be an anaesthetic impact actually resulted in the deaths of 125 of the hostages.

One core problem of the weaponisation of neuroactive agents is that the targets (people) are variable. The RSC study quotes a UK Royal Society report from 2012:

“...when considered as a complete weapon system in an operational context, uncontrollable variables such as the size, health, age etc., of the target population, secondary injury (e.g. airway obstruction), and requirement for medical aftercare introduces further challenges to the development of a safe incapacitating chemical agent” (1)

While there has been extensive direct research on incapacitating chemical agents during the Cold War, one of the main concerns of the RSC study is widely shared in the CW arms control community, and that is the use of the results of civil rather than military programmes that may relate to the value of agents in medical treatments but will be seen to have military potential. This has been raised by, among others, the Office for the Prohibition of Chemical Weapons (OPCW), which monitors the implementation of the Chemical Weapons Convention (CWC). It pointed out in a report from the 2013 CWC Review Conference that:

“...The types of chemicals and pharmaceuticals, known to have been considered as incapacitants from open literature sources, were discussed. Most are centrally acting compounds that target specific neuronal pathways in the brain. All of them emerged from [civil] drug programmes undertaken from the 1960s to the 1980s, as far as can be judged by the research that has been published.” (2)

In this context the use of the term “incapacitant” is particularly relevant in law enforcement, especially riot control operations, and one of the grey areas in the Chemical Weapons Convention is the uncertain boundary between the acceptable use of chemical agents in law enforcement and their banned use as weapons of war.

The central issue here relates to two connected elements, one positive one negative. The first is that the actual workings of the human central nervous system (CNS) is the subject of extensive research which is rapidly increasing the understanding of how the brain works and how it may be influenced and behaviour thereby controlled. Much of this is very recent, one example being the neuropeptide orexin (also called hypocretin), only identified in 1998 but now known to have crucial roles in the functioning of the human nervous system. As a result of this and other research findings it is confidently expected that new generations of pharmaceutical products will result which will be far more effective and controllable than those currently in use for the treatment of a wide range of neurological and mental health conditions.

This will be widely welcomed but the downside is the potential for misuse, not least because of that CWC grey area. Some signatories of the CWC (the “states parties” to use official terminology) already recognise this risk, a 2014 government paper from Australia illustrating this:

“The weaponisation of CNS acting chemicals for law enforcement purposes is of concern to Australia due to the health and safety risks and the possibility of their deliberate misuse, both of which have the potential to undermine the global norm against the use of toxic chemicals for purposes prohibited by the Convention.” (3)

It is this issue of prohibition that is the key element.

Current Relevance

The Chemical Weapons Convention was finally negotiated after the end of the Cold War in the mid-1990s and came into operation in 1998. There have been a number of successes, not least the verified destruction of tens of thousands of tons of chemical weapons produced during the Cold War principally by the United States and the Soviet Union, and there have also been some much less successful developments including recent the CW use in the Middle East.

The main mode of operation of the CWC involves five-yearly review conferences in which the evolution of the Convention and the need for reform are examined. The last (Third) Review Conference was held in April 2013, four months before the first major documented incidence of CW usage in the Syrian war. The Fourth Review Conference involving the states parties to the Convention will take place in The Hague, the city which hosts the OPCW, on 21-30 November this year and it is this event that has prompted the RSC volume.

Thus, two issues interact – the growing concern over the potential misuse of otherwise very valuable neurology research findings and a possible opportunity to limit this risk. What is argued for is that this matter should be a major feature of the Fourth Review Conference with the aim of achieving an agreed ban on the development of CNS-acting weapons.

While such a development would be very welcome, it would not be enough to limit the potential for misuse, which will require sustained action by governments, the arms control community and pressure from wider civil society. While we have recently seen increased concern over actual use of chemical weapons, it is this longer-term issue that deserves sustained attention, with one aim of the RCS volume being to encourage this.

Conclusion

One of the leading specialists in the problems of chemical and biological weapons over more than half a century has been Professor Mathew Meselson at Harvard University. Eighteen years ago he put the issue in perspective when he wrote:

“...During the century ahead, as our ability to modify fundamental life processes continues its rapid advance, we will be able not only to devise additional ways to destroy life but will also become able to manipulate it – including the processes of cognition, development, reproduction and inheritance.... Therein could lie unprecedented opportunities for violence, coercion, repression, or subjugation...”

In particular, he argued further that:

“...Unlike the technologies of conventional or even nuclear weapons, biotechnology has the potential to place mass destructive capabilities in a multitude of hands and, in coming decades, to reach deeply into what we are and how we regard ourselves. It should be evident that any intensive exploitation of biotechnology for hostile purposes could take humanity down a particularly undesirable path.” (4)

Written before the 9/11 attacks and all that has followed since, not least the growth of irregular warfare and radical paramilitary movements willing to use extreme methods, his comments have even greater salience, making the need for positive action, including at the forthcoming CWC Review Conference, even more urgent.

Notes

- (1) Meselson, M. “Averting the hostile exploitation of biotechnology”, *The Chemical and Biological Weapons Conventions Bulletin*, July, 2000, pp. 16–19
- (2) Royal Society. “Neuroscience, conflict and security”, *Brain Waves Module 3*, Royal Society, London, February, 2012.
- (3) OPCW. Report of the Scientific Advisory Board on Developments in Science and Technology for the Third Special Session of the Conference of the States Parties to Review the Operation of the Chemical Weapons Convention, RC-3/DG-1, OPCW, The Hague, 29 October, 2012.
- (4) Australia, “Weaponisation of Central Nervous System Acting Chemicals for Law Enforcement Purposes”, C-19/NAT.1, OPCW, The Hague, 19 November, 2014.

About the Author

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